RHODE ISLAND

HEALTHCARE-ASSOCIATED INFECTIONS PLAN

JANUARY 1,2010

Submitted by

The Rhode Island Department of Health

1. Develop or Enhance HAI program infrastructure

Table 1: State infrastructure planning for HAI surveillance, prevention and control.

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
Level I			1. Establish statewide HAI prevention leadership through the formation of multidisciplinary group or state HAI advisory council.	
	☒	☐	i. Collaborate with local and regional partners (e.g., state hospital associations, professional societies for infection control and healthcare epidemiology, academic organizations, laboratorians and networks of acute care hospitals and long-term care facilities).	Complete
	☒	☐	ii. Identify specific HAI prevention targets consistent with HHS priorities.	Q1 2010
			Other activities or descriptions (not required): • Rhode Island has an established HAI Subcommittee, comprised of the above stakeholder and provider groups. • The HAI Subcommittee will meet monthly between October and January to finalize the HAI Plan by 12/21/09 and then prioritize ongoing work based on the HHS priorities.	
	☒	☐	2. Establish an HAI surveillance prevention and control program. i. Designate a state HAI Prevention Coordinator.	12/21/09
	☐	☒	iii. Develop dedicated, trained HAI staff with at least one FTE (or contracted equivalent) to oversee the four major HAI activity areas (Integration, Collaboration, and Capacity Building; Reporting, Detection, Response and Surveillance; Prevention; Evaluation, Oversight and Communication).	Q1 2010

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
			Other activities or descriptions (not required): • The Department of Health will identify both internal and external HAI subject matter experts (to ensure a range of clinical and epidemiological skill sets), comprising at least 1.0 FTE. • Rhode Island's contractor for the HAI Plan is Quality Partners of Rhode Island, the state's Quality Improvement Organization (QIO). This enables the state to align the HAI Plan work with the QIOs' HAI and NSHN expertise/focus. Two hospitals are working with Quality Partners to use NHSN (Our Lady of Fatima Hospital and Roger Williams Medical Center).	
	☐	☒	3. Integrate laboratory activities with HAI surveillance, prevention and control efforts. i. Improve laboratory capacity to confirm emerging resistance in HAI pathogens and perform typing where appropriate (e.g., outbreak investigation support, HL7 messaging of laboratory results).	Ongoing
			Other activities or descriptions (not required): • In response to this grant a representative from the state's Special Pathogens Laboratory has joined the HAI Subcommittee and will assist with coordination between the public reporting program and the state laboratories. The Special Pathogens Laboratory conducts regular testing and sends results to the CDC, as appropriate. • Additionally, we propose to accomplish capacity building by standardizing and overseeing hospital laboratory activities through the State Laboratory.	
Level II	☒	☐	4. Improve coordination among government agencies or organizations that share responsibility for assuring or overseeing HAI surveillance, prevention and control (e.g., State Survey Agencies, Communicable Disease Control, State Licensing Boards).	12/21/09

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
			Other activities or descriptions (not required): • The HAI Subcommittee includes Department of Health representatives who are involved in epidemiology, physician licensing, and other activities that help to ensure shared responsibility for HAI surveillance, prevention, and control.	
	☐	☐	5. Facilitate use of standards-based formats (e.g., Clinical Document Architecture, electronic messages) by healthcare facilities for purposes of electronic reporting of HAI data. i. Provide technical assistance or other incentives for implementations of standards-based reporting can help develop capacity for HAI surveillance and other types of public health surveillance, such as for conditions deemed reportable to state and local health agencies using electronic laboratory reporting (ELR). ii. Facilitate use of standards-based solutions for external reporting also can strengthen relationships between healthcare facilities and regional nodes of healthcare information, such as Regional Health Information Organizations (RHIOs) and Health Information Exchanges (HIEs).	n/a n/a
			Other activities or descriptions (not required): • While the Department of Health encourages the use of standards-based formats to ensure interoperability and consistency of HAI and other reporting efforts, this was not part of the scope of work proposed by the Department for this grant. • There is a state HIE in the early stages of implementation. It requires patients to opt-in, and will take time for sufficient patients to accrue in order to make it a useful tool for HAI.	

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
Please note: • Due to a state fiscal crisis, the state's 11-year-old public reporting program is being eliminated from the current fiscal year's budget, effective 12/31/09. While the HAI Subcommittee, which was established as part of the public reporting program, will continue under the CDC funding, this means that the programmatic oversight and infrastructure in existence when the grant was awarded will be eliminated. As a result, the HAI Subcommittee has updated the HAI Plan to reflect a stand-alone project limited to the CDC funding. Regardless, the state and its providers remain committed to transparency and reporting, and have a long-standing track record and culture of collecting and disseminating data about quality of care and patient satisfaction. • The Department of Health applied for a CDC Epidemiology and Laboratory Capacity for Infectious Diseases (ELC) grant to implement a MDRO Collaborative, with focus topics to include c-diff and MRSA—but was notified in December 2009 that funding was *not* awarded. These funds would have enabled the Department to increase the FTE allocated to Rhode Island HAI efforts. In the absence of this funding, the HAI Plan cannot support and does not propose to expand NHSN use within Rhode Island. The HAI Subcommittee's prioritization and implementation of the HHS targets will reflect this limitation. • Rhode Island has already published two HAI reports: (1) Surgical Care Infection Program (SCIP) Measures I, II, and III; and (2) Central Line-Associated Bloodstream Infections (CLABSI). These reports are updated quarterly. The next HAI report is anticipated to be employee influenza vaccination data, beginning with data from the 2008-2009 flu season. • Rhode Island is the only state in the nation to have 100% of adult ICUs participating in the ICU Collaborative. The multi-year collaborative has achieved significant improvement on measures such as CLABSI, as well as lives saved and cost savings.				

2. Surveillance, Detection, Reporting, and Response

Table 2: State planning for surveillance, detection, reporting, and response for HAIs

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
Level I			1. Improve HAI outbreak detection and investigation.	
	☒	☐	i. Work with partners including CSTE, CDC, state legislatures, and providers across the healthcare continuum to improve outbreak reporting to state health departments.	Ongoing
	☒	☐	ii. Establish protocols and provide training for health department staff to investigate outbreaks, clusters or unusual cases of HAIs.	Ongoing
	☒	☐	iii. Develop mechanisms to protect facility/provider/ patient identity when investigating incidents and potential outbreaks during the initial evaluation phase where possible to promote reporting of outbreaks.	Ongoing
	☒	☐	iv. Improve overall use of surveillance data to identify and prevent HAI outbreaks or transmission in HC settings (e.g., hepatitis B, hepatitis C, multi-drug resistant organisms [MDRO], and other reportable HAIs).	Ongoing
			Other activities or descriptions (not required): • Surveillance is currently done daily by hospital Infection Control Practitioners (ICPs), with results reported to the state's epidemiologists. The HAI Subcommittee will work with the epidemiologists to learn what is reported, at what thresholds, and what steps are followed, as well as to explore guidelines for non-reportable infections.	
	☐	☐	2. Enhance laboratory capacity for state and local detection and response to new and emerging HAI issues.	n/a

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
			Other activities or descriptions (not required): • Without additional staff and funding, enhanced laboratory capacity is not possible within the Department. The state is currently in a fiscal crisis, with hiring freezes and budget cuts.	
Level II	☒	☐	3. Improve communication of HAI outbreaks and infection control breaches. i. Develop standard reporting criteria including, number, size and type of HAI outbreak for health departments and CDC.	Complete
	☒	☐	ii. Establish mechanisms or protocols for exchanging information about outbreaks or breaches among state and local governmental partners (e.g., State Survey agencies, Communicable Disease Control, state licensing boards).	Complete
			Other activities or descriptions (not required): • Guidelines for these activities exist and will be shared by the Department of Health with the HAI Subcommittee. As mentioned previously, surveillance is currently done daily in hospital Infection Control Practitioners (ICPs), with results reported to the state's epidemiologists.	
			4. Identify at least 2 priority prevention targets for surveillance in support of the HHS HAI Action Plan.	1/25/10 to prioritize among topics
	☒	☐	i. Central Line-Associated Bloodstream Infections (CLABSI)	
	☐	☐	ii. *Clostridium difficile* Infections (CDI)	
	☐	☐	iii. Catheter-associated Urinary Tract Infections (CAUTI)	
	☒	☐	iv. Methicillin-resistant Staphylococcus aureus (MRSA) Infections	

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
	☒	☐	v. Surgical Site Infections (SSI) [via Surgical Care Infection Program (SCIP) Measures I, II, and III – **not NHSN**]	
	☒	☐	vi. Ventilator-associated Pneumonia (VAP) (via the ICU Collaborative)	
			Other activities or descriptions (not required): • Rhode Island has an established HAI Subcommittee that has begun prioritizing HAI reporting topics and will expand its existing work to identify at least two HHS priority topics from the above list. However, in light of the fact that Rhode Island's recent application for ELC funding to implement a MDRO Collaborative was denied, the HAI Plan cannot support and does not propose to expand NHSN use within Rhode Island. The HAI Subcommittee's prioritization, implementation of, and measurement of the HHS targets will reflect this limitation. • The HAI Subcommittee met monthly between October and December 2009 to finalize the HAI Plan and will begin to meet in January 2010 to finalize prioritization of ongoing work based on the HHS priorities. • As mentioned previously, the public reporting program has already published two HAI reports: (1) Surgical Care Infection Program (SCIP) Measures I, II, and III; and (2) Central Line-Associated Bloodstream Infections (CLABSI). These reports are updated quarterly. The next HAI report will be employee influenza vaccination data, beginning with data from the 2008-2009 flu season. Please note that none of these reports use NHSN reporting or data. • The ICU Collaborative participants (all adult ICUs) submit and monitor VAP through the Collaborative's reporting system, not NHSN.	
			5. Adopt national standards for data and technology to track HAIs (e.g., NHSN).	

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
	☐	☒	i. Develop metrics to measure progress towards national goals (align with targeted state goals). (See Appendix 1.)	Incremental, beginning Q1 2010
	☐	☒	ii. Establish baseline measurements for prevention targets.	(see note)
			Other activities or descriptions (not required): • Rhode Island's contractor for the HAI Plan is Quality Partners, the state's QIO, which is currently working with select hospitals on NHSN reporting. This enables the state to leverage existing NSHN training/ expertise for hospitals currently enrolled in NHSN or planning to implement it. • That said, the expansion of NHSN reporting and use of it to establish a baseline was contingent upon the Department's receipt of additional ELC funding to form a 12-month MDRO Collaborative and provide hospitals with technical assistance and support to register with and/or expand their use of NHSN. In light of the fact that Rhode Island's application was denied, the HAI Plan cannot support and does not propose to expand NHSN use within Rhode Island. The HAI Subcommittee's prioritization, implementation of, and measurement strategies for the HHS targets will reflect this limitation.	
	☐	☐	6. Develop state surveillance training competencies. i. Conduct local training for appropriate use of surveillance systems (e.g., NHSN) including facility and group enrollment, data collection, management, and analysis.	n/a

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
			Other activities or descriptions (not required): • Rhode Island's contractor for the HAI Plan is Quality Partners, the state's QIO, which is currently working with two hospitals on NHSN reporting (Our Lady of Fatima Hospital and Roger Williams Medical Center). Quality Partners' experience enables the State to leverage existing NSHN training/expertise. • Two additional hospitals, Rhode Island Hospital and Women and Infants' Hospital, have also begun using select NHSN modules.	
	☒	☐	7. Develop tailored reports of data analyses for state or region prepared by state personnel.	Quarterly
			Other activities or descriptions (not required): • Rhode Island's 11-year-old public reporting mandate (which will be unfunded beginning 1/1/10) uses a stakeholder-guided consensus process to develop and disseminate public reporting formats. The Department of Health will use the HAI Subcommittee to fulfill the above objective. • HAI reporting is already underway, with SCIP, CLABSI, and employee influenza vaccination measures published regularly.	
Level III			8. Validate data entered into HAI surveillance (e.g., through healthcare records review, parallel database comparison) to measure accuracy and reliability of HAI data collection.	
	☐	☐	i. Develop a validation plan.	n/a
	☐	☐	ii. Pilot test validation methods in a sample of healthcare facilities.	n/a
	☐	☐	iii. Modify validation plan and methods in accordance with findings from pilot project.	n/a

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
	☐	☐	iv. Implement validation plan and methods in all healthcare facilities participating in HAI surveillance.	n/a
	☐	☐	v. Analyze and report validation findings.	n/a
	☐	☐	vi. Use validation findings to provide operational guidance for healthcare facilities that targets any data shortcomings detected.	n/a
			Other activities or descriptions (not required): • These activities are not included under Part A funding.	
			9. Develop preparedness plans for improved response to HAI.	
	☒	☐	i. Define processes and tiered response criteria to handle increased reports of serious infection control breaches (e.g., syringe reuse), suspect cases/clusters, and outbreaks.	Complete
			Other activities or descriptions (not required): • Guidelines for these activities exist within the Department of Facilities Regulations at the Department of Health, and will be shared with the HAI Subcommittee.	
	☒	☐	10. Collaborate with professional licensing organizations to identify and investigate complaints related to provider infection control practice in non-hospital settings, and to set standards for continuing education and training.	Ongoing
			11. Adopt integration and interoperability standards for HAI information systems and data sources.	

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
	☐	☒	i. Improve overall use of surveillance data to identify and prevent HAI outbreaks or transmission in HC settings (e.g., hepatitis B, hepatitis C, multi-drug resistant organisms (MDRO), and other reportable HAIs) across the spectrum of inpatient and outpatient healthcare settings.	Ongoing
	☐	☒	ii. Promote definitional alignment and data element standardization needed to link HAI data across the nation.	Ongoing
			Other activities or descriptions (not required): • Surveillance is currently done daily by hospital Infection Control Practitioners (ICPs), with results reported to the state's epidemiologists. As discussed previously, the HAI Subcommittee will work with the epidemiologists to learn what is reported, at what thresholds, and what steps follow, as well as to explore guidelines for non-reportable infections. • Improved use of the surveillance data will result from the inclusion of Dr. Utalpa Bandy, state epidemiologist, and Cindy Vanner, from the state's Special Pathogens Laboratory, on the HAI Subcommittee. They will assist with coordination between the public reporting program and the state epidemiology and laboratory work.	
			12. Enhance electronic reporting and information technology for healthcare facilities to reduce reporting burden and increase timeliness, efficiency, comprehensiveness, and reliability of the data.	
	☒	☐	i. Report HAI data to the public.	Ongoing

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
			Other activities or descriptions (not required): • Rhode Island has a long-standing public reporting mandate and, as mentioned previously, has already published two HAI reports: (1) Surgical Care Infection Program (SCIP) Measures I, II, and III; and (2) Central Line-Associated Bloodstream Infections (CLABSI). These reports are updated quarterly. The next HAI report will be employee influenza vaccination data, beginning with data from the 2008-2009 flu season.	
	☒	☐	13. Make available risk-adjusted HAI data that enables state agencies to make comparisons between hospitals.	Ongoing
			Other activities or descriptions (not required): • Rhode Island has a long-standing public reporting mandate, although the public reporting program (as noted previously) will be eliminated from state funding on 12/31/09. The program reports risk-adjusted clinical quality measures and patient satisfaction to enable healthcare consumers, providers, and other stakeholders to make between-facility comparisons. • HAI reporting is already underway, with SCIP and CLABSI published regularly, and employee influenza vaccination reporting planned. Please note that none of these reports use NHSN reporting or data.	
	☐	☐	14. Enhance surveillance and detection of HAIs in non-hospital settings.	
			Other activities or descriptions (not required): • This activity is not included under Part A funding, although physician reporting of reportable HAIs is mandated.	

3. Prevention

Table 3: State planning for HAI prevention activities

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
Level I	☒	☐	1. Implement HICPAC recommendations. i. Develop strategies for implementation of HICPAC recommendations for at least 2 prevention targets specified by the state multidisciplinary group.	Q1 2010
			Other activities or descriptions (not required): • The HAI Subcommittee will prioritize the HHS prevention targets and identify measurement strategies for those targets selected for implementation (e.g., hand hygiene process measures for MRSA containment). • However, in light of the fact that Rhode Island's recent application for ELC funding to implement a MDRO Collaborative was denied, the HAI Plan cannot support and does not propose to expand NHSN use within Rhode Island. The HAI Subcommittee's prioritization, implementation of, and measurement strategies for the HHS targets will reflect this limitation.	
	☐	☐	2. Establish prevention working group under the state HAI advisory council to coordinate the state HAI collaborative. i. Assemble expertise to consult, advise, and coach inpatient healthcare facilities involved in HAI prevention collaborative.	n/a
			Other activities or descriptions (not required): • The Department of Health did not propose a HAI prevention collaborative as part of the grant application. This work is not funded. • Rhode Island HAI Subcommittee already exists and is comprised of the above stakeholder and provider groups.	

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
			3. Establish HAI collaboratives with at least 10 hospitals (i.e. this may require a multi-state or regional collaborative in low population density regions).	
	☐	☐	i. Identify staff trained in project coordination, infection control, and collaborative coordination.	n/a
	☐	☐	ii. Develop a communication strategy to facilitate peer-to-peer learning and sharing of best practices.	n/a
	☐	☐	iii. Establish and adhere to feedback of a clear and standardized outcome data to track progress.	n/a
			Other activities or descriptions (not required): • The Department of Health did not propose a HAI prevention collaborative as part of this grant application. This work is not funded. • The Department of Health will identify both internal and external HAI subject matter experts, to ensure a range of clinical and epidemiological skill sets, comprising at least 1.0 FTE.	
	☐	☐	4. Develop state HAI prevention training competencies. i. Consider establishing requirements for education and training of healthcare professionals in HAI prevention (e.g., certification requirements, public education campaigns and targeted provider education) or work with healthcare partners to establish best practices for training and certification.	n/a
			Other activities or descriptions (not required): • The HAI Subcommittee will review the state's education and training standards and consider any opportunities for alignment with national standards, but this work is not specifically funded under the CDC grant.	

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
Level II			5. Implement strategies for compliance to promote adherence to HICPAC recommendations.	
	☐	☐	i. Consider developing statutory or regulatory standards for healthcare infection control and prevention or work with healthcare partners to establish best practices to ensure adherence.	n/a
	☐	☐	ii. Coordinate/liaise with regulation and oversight activities such as inpatient or outpatient facility licensing/accrediting bodies and professional licensing organizations to prevent HAIs.	n/a
	☐	☐	iii. Improve regulatory oversight of hospitals, enhancing surveyor training and tools, and adding sources and uses of infection control data.	n/a
	☐	☐	iv. Consider expanding regulation and oversight activities to currently unregulated settings where healthcare is delivered or work with healthcare partners to establish best practices to ensure adherence.	n/a
			Other activities or descriptions (not required): • The HAI Subcommittee is comprised of Infection Control Practitioners (ICPs), hospital staff, Department staff, and other stakeholders with vested interests in limiting HAI in Rhode Island. These Subcommittee members will assist with establishing collaborative partnerships and policies and procedures that further reduce HAI in the state, although this work is not specifically funded by the CDC grant.	
	☐	☐	6. Enhance prevention infrastructure by increasing joint collaboratives with at least 20 hospitals (i.e., this may require a multi-state or regional collaborative in low population density regions)	
			Other activities or descriptions (not required): • The Department of Health did not propose a HAI prevention collaborative as part of the grant application. This work is not funded.	n/a

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
	☐	☐	7. Establish collaborative to prevent HAIs in nonhospital settings (e.g., long term care, dialysis)	n/a
			Other activities or descriptions (not required): • The Department of Health did not propose a HAI prevention collaborative as part of the grant application. This work is not funded.	

Please also describe any additional activities, not listed above, that your state plans to undertake. Please include target dates for any new activities.

- The Department of Health applied for a CDC Epidemiology and Laboratory Capacity for Infectious Diseases (ELC) grant to implement a 12-month MDRO Collaborative. If funded, this project would have aligned with the existing state HAI Plan and ongoing public reporting work, and would have provided a mechanism for the Department to expand the Plan to include the activities listed in Table 3. Unfortunately, this application for funding was denied.

4. Evaluation and Communications

Table 4: State HAI communication and evaluation planning

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
Level I			1. Conduct needs assessment and/or evaluation of the state HAI program to learn how to increase impact.	
	☐	☒	i. Establish evaluation activity to measure progress towards targets, and	Q1 2010
	☐	☒	ii. Establish systems for refining approaches based on data gathered.	Q2 2011
			Other activities or descriptions (not required): • The HAI Subcommittee will continually review the publicly reported data to observe trends and make recommendations to the Department and, possibly, to the hospitals. Please note that this funding does not establish a MDRO Collaborative to specifically implement, measure, or refine improvement strategies.	
	☐	☒	2. Develop and implement a communication plan about the state's HAI program and progress to meet public and private stakeholders' needs. i. Disseminate state priorities for HAI prevention to healthcare organizations, professional provider organizations, governmental agencies, non-profit public health organizations, and the public.	Q2 2010
			Other activities or descriptions (not required): • Rhode Island's established HAI Subcommittee is comprised of the above stakeholder and provider groups, and often outreaches to Infection Control Practitioners (ICPs) and others in the state with an interest in HAI surveillance and prevention. The communication plan will enable more formal dissemination of information.	

Planning Level	Underway	Planned	Items Planned for Implementation	Target Dates
Level II	☒	☐	3. Provide consumers access to useful healthcare quality measures.	Ongoing
			Other activities or descriptions (not required): • Rhode Island's public reporting program (which will be eliminated from funding on 12/31/09) publishes information on healthcare quality, including clinical outcomes and patient satisfaction, on the Department of Health's website. The HAI Subcommittee's work to date is included there. As a result of the funding Rhode Island received for Activity A, some level of public reporting will be continued for HAI.	
Level III	☒	☐	4. Identify priorities and provide input to partners to help guide patient safety initiatives and research aimed at reducing HAIs.	Ongoing
			Other activities or descriptions (not required): • Rhode Island's contractor for the HAI Plan is Quality Partners of Rhode Island, the state's Quality Improvement Organization (QIO), which is implementing Medicare's National Patient Safety Initiative (NPSI) with local nursing homes and hospitals. The NPSI work in the hospital setting involves improving MRSA rates. • However, in light of the fact that Rhode Island's recent application for ELC funding to implement a MDRO Collaborative was denied, the HAI Plan cannot support and does not propose to expand NHSN use within Rhode Island. The HAI Subcommittee's prioritization, implementation of, and measurement of the HHS targets will reflect this limitation.	

Appendix 1.

The HHS Action plan identifies metrics and 5-year national prevention targets. These metrics and prevention targets were developed by representatives from various federal agencies, the Healthcare Infection Control Practices Advisory Committee (HICPAC), professional and scientific organizations, researchers, and other stakeholders. The group of experts was charged with identifying potential targets and metrics for six categories of healthcare-associated infections:

- Central Line-associated Bloodstream Infections (CLABSI)
- Clostridium difficile Infections (CDI)
- Catheter-associated Urinary Tract Infections (CAUTI)
- Methicillin-resistant Staphylococcus aureus (MRSA) Infections
- Surgical Site Infections (SSI)
- Ventilator-associated Pneumonia (VAP)

Following the development of draft metrics as part of the HHS Action Plan in January 2009, HHS solicited comments from stakeholders for review.

Stakeholder feedback and revisions to the original draft Metrics

Comments on the initial draft metrics published as part of the HHS Action Plan in January 2009 were reviewed and incorporated into revised metrics. While comments ranged from high level strategic observations to technical measurement details, commenters encouraged established baselines, both at the national and local level, use of standardized definitions and methods, engagement with the National Quality Forum, raised concerns regarding the use of a national targets for payment or accreditation purposes and of the validity of proposed measures, and would like to have both a target rate and a percent reduction for all metrics. Furthermore, commenters emphasized the need for flexibility in the metrics, to accommodate advances in electronic reporting and information technology and for advances in prevention of HAIs, in particular ventilator-associated pneumonia.

To address comments received on the Action Plan Metrics and Targets, proposed metrics have been updated to include source of metric data, baselines, and which agency would coordinate the measure. To respond to the requests for percentage reduction in HAIs in addition to HAI rates, a new type of metric, the standardized infection ratio (SIR), is being proposed. Below is a detailed technical description of the SIR.

To address concerns regarding validity, HHS is providing funding, utilizing Recovery Act of 2009 funds, to CDC to support states in validating NHSN-related measures and to support reporting on HHS metrics through NHSN. Also, most of the reporting metrics outlined here have already been endorsed by NQF and for population-based national measures on MRSA and *C. difficile*, work to

develop hospital level measures will be conducted in the next year utilizing HHS support to CDC through funds available in the Recovery Act.

Finally, to address concerns regarding flexibility in accommodating new measures, reviewing progress on current measures, and incorporating new sources of measure data (e.g., electronic data, administrative data) or new measures, HHS and its constituent agencies will commit to an annual review and update of the HHS Action Plan Targets and Metrics.

Below is a table of the revised metrics described in the HHS Action plan. Please select items or add additional items for state planning efforts.

Metric Number and Label	Original HAI Elimination Metric	HAI Comparison Metric	Measurement System	National Baseline Established (State Baselines Established)	National 5-Year Prevention Target	Coordinator of Measurement System	Is the metric NQF endorsed?
1. CLABSI 1	CLABSIs per 1000 device days by ICU and other locations	CLABSI SIR	CDC NHSN Device-Associated Module	2006-2008 (Proposed 2009, in consultation with states)	Reduce the CLABSI SIR by at least 50% from baseline or to zero in ICU and other locations	CDC	Yes*
2. CLIP 1 (formerly CLABSI 4)	Central line bundle compliance	CLIP Adherence percentage	CDC NHSN CLIP in Device-Associated Module	2009 (Proposed 2009, in consultation with states)	100% adherence with central line bundle	CDC	Yes†
3a. C diff 1	Case rate per patient days; administrative/discharge data for ICD-9 CM coded *Clostridium difficile* Infections	Hospitalizations with *C. difficile* per 1000 patient discharges	Hospital discharge data	2008 (Proposed 2008, in consultation with states)	At least 30% reduction in hospitalizations with *C. difficile* per 1000 patient discharges	AHRQ	No
3b. C diff 2 (New)		*C. difficile* SIR	CDC NHSN MDRO/CDAD Module LabID‡	2009-2010	Reduce the facility-wide healthcare facility-onset *C. difficile* LabID event SIR by at least 30% from baseline or to zero	CDC	No

Metric Number and Label	Original HAI Elimination Metric	HAI Comparison Metric	Measurement System	National Baseline Established (State Baselines Established)	National 5-Year Prevention Target	Coordinator of Measurement System	Is the metric NQF endorsed?
4. CAUTI 2	# of symptomatic UTI per 1,000 urinary catheter days	CAUTI SIR	CDC NHSN Device-Associated Module	2009 for ICUs and other locations 2009 for other hospital units (Proposed 2009, in consultation with states)	Reduce the CAUTI SIR by at least 25% from baseline or to zero in ICU and other locations	CDC	Yes*
5a. MRSA 1	Incidence rate (number per 100,000 persons) of invasive MRSA infections	MRSA Incidence rate	CDC EIP/ABCs	2007-2008 (for non-EIP states, MRSA metric to be developed in collaboration with EIP states)	At least a 50% reduction in incidence of healthcare-associated invasive MRSA infections	CDC	No
5b. MRSA 2 (New)		MRSA bacteremia SIR	CDC NHSN MDRO/CDAD Module LabID‡	2009-2010	Reduce the facility-wide healthcare facility-onset MRSA bacteremia LabID event SIR by at least 25% from baseline or to zero	CDC	No
6. SSI 1	Deep incision and organ space infection rates using NHSN definitions (SCIP procedures)	SSI SIR	CDC NHSN Procedure-Associated Module	2006-2008 (Proposed 2009, in consultation with states)	Reduce the admission and readmission SSI§ SIR by at least 25% from baseline or to zero	CDC	Yes¶
7. SCIP 1 (formerly SSI 2)	Adherence to SCIP/NQF infection process measures	SCIP Adherence percentage	CMS SCIP	To be determined by CMS	At least 95% adherence to process measures to prevent surgical site infections	CMS	Yes

* NHSN SIR metric is derived from NQF-endorsed metric data
† NHSN does not collect information on daily review of line necessity, which is part of the NQF
‡ LabID, events reported through laboratory detection methods that produce proxy measures for infection surveillance
§ Inclusion of SSI events detected on admission and readmission reduces potential bias introduced by variability in post-discharge surveillance efforts
¶ The NQF-endorsed metric includes deep wound and organ space SSIs only which are included the target.

Understanding the Relationship between HAI Rate and SIR Comparison Metrics

The Original HAI Elimination Metrics listed above are very useful for performing evaluations. Several of these metrics are based on the science employed in the NHSN. For example, metric #1 (CLABSI 1) for CLABSI events measures the number of CLABSI events per 1000 device (central line) days by ICU and other locations. While national aggregate CLABSI data are published in the annual NHSN Reports these rates must be stratified by types of locations to be risk-adjusted. This scientifically sound risk-adjustment strategy creates a practical challenge to summarizing this information nationally, regionally or even for an individual healthcare facility. For instance, when comparing CLABSI rates, there may be quite a number of different types of locations for which a CLABSI rate could be reported. Given CLABSI rates among 15 different types of locations, one may observe many different combinations of patterns of temporal changes. This raises the need for a way to combine CLABSI rate data across location types.

A standardized infection ratio (SIR) is identical in concept to a standardized mortality ratio and can be used as an indirect standardization method for summarizing HAI experience across any number of stratified groups of data. To illustrate the method for calculating an SIR and understand how it could be used as an HAI comparison metric, the following example data are displayed below:

Risk Group Stratifier	Observed CLABSI Rates			NHSN CLABSI Rates for 2008 (Standard Population)		
Location Type	#CLABSI	#Central line-days	CLABSI rate*	#CLABSI	#Central line-days	CLABSI rate*
ICU	170	100,000	1.7	1200	600,000	2.0
WARD	58	58,000	1.0	600	400,000	1.5

$$SIR = \frac{observed}{expected} = \frac{170+58}{100000\times\left(\frac{2}{1000}\right)+58{,}000\times\left(\frac{1.5}{1000}\right)} = \frac{228}{200+87} = \frac{228}{287} = 0.79$$

95%CI = (0.628,0.989)

*defined as the number of CLABSIs per 1000 central line-days

In the table above, there are two strata to illustrate risk-adjustment by location type for which national data exist from NHSN. The SIR calculation is based on dividing the total number of observed CLABSI events by an "expected" number using the CLABSI rates from the standard population. This "expected" number is calculated by multiplying the national CLABSI rate from the standard population by the observed number of central line-days for each stratum, which can also be understood as a prediction or projection. If the observed data represented a follow-up period such as 2009 one would state that an SIR of 0.79 implies that there was a 21% reduction in CLABSIs overall for the nation, region or facility.

The SIR concept and calculation is completely based on the underlying CLABSI rate data that exist across a potentially large group of strata. Thus, the SIR provides a single metric for performing comparisons rather than attempting to perform multiple comparisons across many strata, which makes the task cumbersome. Given the underlying CLABSI rate data, one retains the option to perform comparisons within a particular set of strata where observed rates may

differ significantly from the standard populations. These types of more detailed comparisons could be very useful and necessary for identifying areas for more focused prevention efforts.

The National 5-year prevention target for metric #1 could be implemented using the concept of an SIR equal to 0.25 as the goal. That is, an SIR value based on the observed CLABSI rate data at the 5-year mark could be calculated using NHSN CLABSI rate data stratified by location type as the baseline to assess whether the 75% reduction goal was met. There are statistical methods that allow for calculation of confidence intervals, hypothesis testing and graphical presentation using this HAI summary comparison metric called the SIR.

The SIR concept and calculation can be applied equitably to other HAI metrics list above. This is especially true for HAI metrics for which national data are available and reasonably precise using a measurement system such as the NHSN. The SIR calculation methods differ in the risk group stratification only. To better understand metric #6 (SSI 1) see the following example data and SIR calculation:

Risk Group Stratifiers		**Observed SSI Rates**			**NHSN SSI Rates for 2008 (Standard Population)**		
Procedure Code	**Risk Index Category**	**#SSI†**	**#procedures**	**SSI rate***	**#SSI†**	**#procedures**	**SSI rate***
CBGB	1	315	12,600	2.5	2100	70,000	3.0
CBGB	2,3	210	7000	3.0	1000	20,000	5.0
HPRO	1	111	7400	1.5	1020	60,000	1.7

$$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{315+210+111}{12600\times\left(\frac{3.0}{100}\right)+7000\times\left(\frac{5.0}{100}\right)+7400\left(\frac{1.7}{100}\right)} = \frac{636}{378+350+125.8} = \frac{636}{853.8} = 0.74 \qquad 95\%\text{CI} = (0.649, 0.851)$$

† SSI, surgical site infection

* defined as the number of deep incision or organ space SSIs per 100 procedures

This example uses SSI rate data stratified by procedure and risk index category. Nevertheless, an SIR can be calculated using the same calculation process as for CLABSI data except using different risk group stratifiers for these example data. The SIR for this set of observed data is 0.74 which indicates there's a 26% reduction in the number of SSI events based on the baseline NHSN SSI rates as representing the standard population. Once again, these data can reflect the national picture at the 5-year mark and the SIR can serve as metric that summarizes the SSI experience into a single comparison.

There are clear advantages to reporting and comparing a single number for prevention assessment. However, since the SIR calculations are based on standard HAI rates among individual risk groups there is the ability to perform more detailed comparisons within any individual risk group should the need arise. Furthermore, the process for determining the best risk-adjustment for any HAI rate data is flexible and always based on more detailed risk factor analyses that provide ample scientific rigor supporting any SIR calculations. The extent to which any HAI rate data can be risk-adjusted is obviously related to the detail and volume of data that exist in a given measurement system.

In addition to the simplicity of the SIR concept and the advantages listed above, it's important to note another benefit of using an SIR comparison metric for HAI data. If there was need at any level of aggregation (national, regional, facility-wide, etc.) to combine the SIR values across mutually exclusive data one could do so. The below table demonstrates how the example data from the previous two metric settings could be summarized.

	Observed HAIs			**Expected HAIs**		
HAI Metric	**#CLABSI**	**#SSI†**	**#Combined HAI**	**#CLABSI**	**#SSI†**	**#Combined HAI**
CLABSI 1	228			287		
SSI 1		636			853.8	
Combined HAI			228 + 636 = 864			287+853.8 = 1140.8

$$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{228+636}{287+853.8} = \frac{864}{1140.8} = 0.76 \qquad 95\%\text{CI} = (0.673, 0.849)$$

† SSI, surgical site infection